

Specification

(Case No. 03-038)

TO ALL WHOM IT MAY CONCERN:

Be it known that Michael T. Lundy, a citizen of the United States and a resident of Olathe, Kansas 66061, residing at 2644 West Centre has invented a certain new and useful

PORTABLE PHONE HAVING TRANSFORMABLE COMPONENTS

of which the following is a specification.

BACKGROUND OF INVENTION

1. Field of Invention

The present invention is directed to a portable phone and more particularly to a portable phone allowing for relative movement of components.

2. Background of the Invention

The use of portable phones has increased greatly over the last several years. In fact, portable phones are now used for a number of purposes beyond simply having a telephone conversation. For example, portable phones are now used to send text messages, to send e-mails, to browse the web, and to play games. At the same time, handheld gaming products and software have become increasingly popular. As a result, portable phones have been adapted to support gaming and gaming software. Many phones are equipped with Java Virtual machines that allow them to download and play games. A typical portable phone has a keypad, a display screen, and a navigational key positioned between the keypad and the display screen. The typical arrangement of the keypad, navigational key, and display screen is not ideal for many gaming applications. The close proximity of the traditional keypad and navigational key can be tedious and cumbersome to use for playing the various games now available on portable phones. This layout makes two-hand operation cumbersome and obstructs a user's view of the screen.

In addition, in some gaming applications, it useful to have a display screen positioned between the navigational key and the keypad, while in others it may be useful to have a display screen positioned generally above and centered between the navigational key and the keypad. The GameBoy device available from Nintendo is an

example of a handheld gaming device having various configurations with the display centrally positioned between activation keys to facilitate two-hand operation. The typical arrangement of a standard portable phone does not provide the same ergonomics as a GameBoy or other handheld gaming device where the display is not centered between the activation keys. As a result, an attachable game controller has been developed for attachment to a portable phone to allow users to play games with their standard portable phone. One such device is known as the PCS Game Pad for use with the Samsung A600 portable phone providing control keys on both sides of the portable phone. While a useful device, the use of the Game Pad requires a user to carry both the standard portable phone and the Game Pad to achieve enhanced gaming abilities. It takes up a lot of space and is cumbersome to carry both the portable phone and an attachable game controller. Oftentimes it is impractical to carry both a phone and a separate game controller, and even when practical, the game controller may frequently be inadvertently left behind.

Accordingly, there is a need to provide a portable phone that allows for relative movement of one or more of the display screen, navigational key, and keypad to allow for improved ergonomics for gaming and other applications, without the need for an attachable game controller.

SUMMARY OF THE INVENTION

In the present embodiments, one embodiment is directed to a portable phone having a navigational key positioned between a display screen and a keypad where the display screen is adapted to pivot (preferably about 90 degrees) about the phone housing to allow the display screen to be positioned to the side of the navigational key and the keypad. In addition, the keypad and/or navigational key may be extendable from the

housing to allow for more ideal positioning of the navigational key and keypad for gaming applications.

In another embodiment, a portable phone is normally in a first configuration wherein the navigational key is positioned between the keypad and the display screen. The navigational key and display screen are both rotatably mounted to the phone housing such that they can be rotated generally 180 degrees to allow the display screen to be positioned between the navigational key and the keypad. In this embodiment, the keypad and/or navigational key may be extendable from the housing to allow for more ideal positioning of the navigational key and keypad for gaming applications. In this embodiment, the display screen may be switched from landscape viewing to portrait viewing to support gaming applications.

The present invention provides a portable phone that allows for relative positioning and movement of one or more of the display screen, navigational key, and keypad to allow for improved ergonomics for gaming and other applications, without the need for an attachable game controller.

BRIEF DESCRIPTION OF THE DRAWINGS

Further advantages of the present invention will become apparent to those skilled in the art with the benefit of the following detailed description of the preferred embodiments and upon reference to the accompanying drawings in which:

FIGURE 1 is a top view of a portable phone having a conventional layout of the display screen, navigational key, and keypad;

FIGURE 2 is a top view of the phone of Figure 1 showing the display screen rotated 90 degrees and positioned above and centered between the navigational key and keypad;

FIGURE 3a is a top view of the phone of Figure 1, where the navigational key and display screen have been rotated 180 degrees;

FIGURE 3b is a side view of the phone of Figure 3a;

FIGURE 4 is a top view of the phone of Figure 3a, showing the navigational key and keypad in extended positions.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof are shown by way of example in the drawings and will herein be described in detail. It should be specifically understood with respect to the drawings, that the drawings are of preferred embodiments, and there are many other embodiments and forms in which the present invention may appear. It should also be understood that the drawings and detailed description thereof are not intended to limit the invention to the particular form disclosed, but on the contrary, the invention is to cover all modifications, equivalents and alternatives falling within the spirit and scope of the present invention or within the scope of the appended claims.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference to Figure 1, an illustrative portable phone 10 is shown having a conventional arrangement of display screen 14, navigational key 16, and keypad 18 on phone housing 12. The display screen 14 may be of any conventional type including color or monochromatic. The navigational key 16 is typically a four-position (up, down, left, right) key, wherein pressure on the left or right side of the key moves a cursor on the display to the left or right respectively, pressure on the top or bottom of the key moves the cursor on the display up or down respectively, and pressing the center of the key serves as an entry command. This type of navigational key is commonly used in portable phones to allow a user to scroll up or down, move to the right or left, and ultimately select with the control activation key. The present invention contemplates the use of this type of navigational key, but is in no way limited to this particular type of navigational key. Other types of navigational keys having additional (or fewer) positions, or even multiple keys may also be used, and are also within the scope of the invention. The keypad 18 is shown as a conventional numeric keypad commonly used on portable phones, having digits 0-9, and a star key “*” and a pound key “#,” although the present invention is in no way limited to this type of a keypad. Other keypads including those having more (or fewer) keys, or a virtual keyboard, may also be used, and are within the scope of the invention. In addition, the keypad 18 may be a virtual keypad appearing on a display. The phone housing can be made using conventional manufacturing methods, including molding and forming of plastic, and further may house conventional telephone circuitry.

Figure 2 shows portable phone 10 where the display screen 14 has been rotated about the phone housing 12 from a first position denoted with dotted lines to a second position in which the display screen 14 is positioned to the side of the navigational key 16 and keypad 18. Preferably, when a user holds the phone 10 with the left thumb on the navigational key 16 and the right thumb on the keypad 18, the display screen 14 is centered between the user's hands to better facilitate the gaming experience. The display screen 14 can preferably be mounted to the housing using a conventional pivot arrangement as is known in the art. As an example, the display may pivot about a pivot point and a circular slide switch used to provide any necessary electrical connections. A combination mechanical arm and slide mechanism could also be used. As shown in Figure 2, the entire upper portion of the phone housing on which the display screen 14 is positioned is movable from a first position to the second position. However, it is also envisioned that only the display screen, or less than the entire top portion of the housing, would be rotated from the first position to the second position. In addition, in the same manner as depicted in Figure 4, either or both the navigational key 16 and the keypad 18 may be extendable from the phone housing 12 to provide a greater distance between the two and to facilitate better two-hand operation. It will be appreciated that in Figures 1 and 2, the navigational key in the normal, first position is positioned between the display screen and the keypad. However, it is also within the scope of the invention to have the keypad positioned between the display screen and navigational key. In this scenario, the display still may rotate 90 degrees from the housing.

Figure 3a-3b show an alternate embodiment of a portable phone 10. In this embodiment, the navigational key 16 and the display screen 14 are rotatably mounted

about the phone housing 12, such that they are both rotatable 180 degrees from a conventional configuration as shown in Figure 1. Thus, for gaming applications the display screen 14 and the navigational key 16 can “switch places” to allow the conventional phone to be transformed into a device more suitable for gaming applications. Preferably, both the navigational key 16 and the display screen 14 are pivotally mounted to a pivot 20 located on the phone housing 12. The navigational key 16 and display screen 14 may pivot about pivot 20 in a conventional manner. As an example, the navigational key 16 and display screen 14 may pivot about a pivot point and a circular slide switch may be used to provide any necessary electrical connections. This configuration allows the phone to be transformed into a more suitable gaming device while retaining the same size as a conventional phone.

Once rotated, the navigational key 16 and display screen 14 may be retained in position by a suitable locking mechanism, such as a conventional detent and corresponding protrusion, or even a ratchet and pawl indexing mechanism. Alternately, the navigational key and display screen could be pulled in an upward direction, away from the phone housing, to release a detect or retention pin. In the upward position, the navigational key and display are free to rotate. After rotating 180 degrees, the navigational key and display screen could be pushed downward into a flush position with the phone housing, where the detent or retention pin is placed into a corresponding retention pin opening positioned 180 degrees from the original position. A hasp or clasp could be used as well. Alternately, the navigational key 16 and display screen 14 could be locked in position by means of a detent or retention pin positioned above the keypad and extending in an axial direction towards the navigational key 16 and display screen

14. The keypad 18 could be extended away from the navigational key 16 and display screen 14 (see Figure 4) to release the retention pin and allow for rotation, and then moved back into its original position to once again serve as a lock against undesired rotation. It will also be appreciated that in Figures 3 and 4, the navigational key in the normal, first position is positioned between the display screen and the keypad. However, it is also within the scope of the invention to have the keypad positioned between the display screen and navigational key. In this scenario, the display screen and keypad will rotate 180 degrees about the housing.

Figure 4 shows the phone 10 of Figure 3a-3b with the display screen 14 rotated into position between navigational key 16 and keypad 18. The keypad 18 is shown extending from the display screen 14. The keypad 18 may include a slide 22 adapted to cooperate with a corresponding slideway in the phone housing 12 to allow the keypad to be extended from the display screen 14 to provide for improved ergonomics and to facilitate better two-hand operation by the user. Likewise, the navigational key 16 may also include a slide 22 adapted to cooperate with a corresponding slideway in the phone housing 12 to provide for improved ergonomics and to facilitate better two-hand operation by the user.